





# UNITED STATES PATENT OFFICE.

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## FLUID-BEARING.

SPECIFICATION forming part of Letters Patent No. 741,628, dated October 20, 1903.

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*To all whom it may concern:*

Be it known that I, JOHN FRANCIS COOLEY, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Fluid-Bearings, of which the following is a specification.

My invention relates to a fluid-bearing in which the weight of the rotating element is supported by a fluid under pressure, and a construction embodying my invention is illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal section of the device on line *b b*, Fig. 2, looking in the direction of arrow. Fig. 2 is a cross-section on line *a a*, Fig. 1, looking in the direction of arrow. Fig. 3 is a front elevation of the sleeve B, showing groove in exterior portion. Fig. 4 is a perspective view of the strip D, which fits in the exterior groove of the sleeve B. Fig. 5 is a perspective view of the packing-ring G. Fig. 6 is a perspective view of the threaded ring K.

Referring to the drawings, a shaft A has rigidly mounted thereon the sleeve B, held in position by set-screws C and C'. The sleeve B carries the strips D, D', D<sup>2</sup>, and D<sup>3</sup>, set in the longitudinal grooves and actuated by springs F. The packing-rings G, closely fitting the box H, are of larger external diameter than the sleeve B and fit over the projecting bases of the spring-actuated strips D, D', D<sup>2</sup>, and D<sup>3</sup>.

The internal diameter of the packing-rings G being larger than the base of the annular space I, Fig. 3, formed by the sleeve B and threaded rings K, screwed on the reduced ends of the sleeve, the rings G are held in close moving fit thereby, and a lateral motion is allowed. The strips D, D', D<sup>2</sup>, and D<sup>3</sup> and packing-rings G form, with the sleeve B and the box H, thin closed chambers J, J', J<sup>2</sup>, and J<sup>3</sup>. The threaded rings K in position cover the set-screws C and C', keeping the same from working loose.

The fluid-cup M, tightly covered by the cap M', communicates with the closed chambers J, J', J<sup>2</sup>, and J<sup>3</sup> by means of the duct N. The reservoirs P are connected by the duct Q at their lowest points, and communication is established with duct N by means of duct O.

The operation of the bearing is as follows: The working fluid is admitted to the chambers J, J', J<sup>2</sup>, and J<sup>3</sup> and to the reservoirs P by means of the cup M. (See Fig. 2.) The sleeve B of the shaft A rests upon the box H at its lowest point. The strips D and D<sup>3</sup> and the packing-rings O, with the box H and sleeve B, form the thin closed chamber J. The shaft A rotating in the direction of the arrow, a vacuum is formed in the chamber J, which when the strip D has passed the duct N actuates and causes the fluid to enter and fill the said chamber from the reservoirs P through the ducts Q, O, and N. When the strip D<sup>3</sup> has passed the duct N, the chamber J<sup>3</sup> repeats the process, as does also chamber J<sup>2</sup>. Meanwhile the chamber J' having been filled with fluid from the cup M and turning in the direction of the arrow reaches the position occupied in the illustration by chamber J<sup>3</sup>. The pressure of the fluid immediately causes the shaft A to rise or float in the box H. The chamber J having passed to the duct N repeats the operation, and so on until the shaft A has assumed a central position in the box H and the fluid area is equalized in all the chambers.

Any seepage from the bearing collects in the reservoirs P, which reservoirs supply the vacuum caused by such seepage with fluid, as hereinbefore described.

Having thus described the nature of my invention and set forth a construction embodying the same, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a bearing, a sleeve fixed upon a shaft, radially-adjustable splines arranged in grooves in the periphery of the sleeve, rings arranged in annular grooves near the extremities of the sleeve, said rings forming longitudinal and radial limitations for said splines, a cylindrical bearing-case whose bore is slightly larger than said sleeve and inclosing said parts, and means for admitting fluid to the bearing.

2. In a bearing, a sleeve fixed upon a shaft, radially-adjustable splines longitudinally arranged in grooves in the periphery of the sleeve, threaded rings fitted on reduced ends of the sleeve, rings arranged in annular grooves near the extremities of the sleeve,



said rings forming longitudinal and radial limitations for said splines, a cylindrical bearing-case whose bore is slightly larger than said sleeve and inclosing said parts, and  
5 means for admitting fluid to the bearing.

3. In a bearing, a sleeve fixed upon a shaft, radially-adjustable splines longitudinally arranged in grooves in the periphery of the sleeve, rings arranged in annular grooves  
10 near the extremities of the sleeve, said rings forming longitudinal and radial limitations for said splines, a cylindrical bearing-case whose bore is slightly larger than said sleeve inclosing said parts, there being annular  
15 spaces around the interior extremities of said case forming fluid-reservoirs, and means for admitting fluid to the bearing.

4. In a bearing, a sleeve fixed upon a shaft, radially-adjustable splines arranged in  
20 grooves in the periphery of the sleeve, threaded rings fitted on reduced ends of the sleeve, said rings with the sleeve forming annular grooves near each extremity, packing-rings of larger external diameter than said sleeve ar-  
25 ranged in said annular grooves, a cylindrical bearing-case whose bore is slightly larger than said sleeve and inclosing said parts, said bearing-case forming with said sleeve, pack-

ing-rings and radially-adjustable splines, thin closed chambers, annular spaces around the  
30 interior extremities of said cylinder forming reservoirs, and means for admission of fluid to the bearing.

5. In a bearing, a sleeve fixed upon a shaft, radially-adjustable splines arranged in  
35 grooves in the periphery of the sleeve; threaded rings fitted on reduced ends of the sleeve, said rings with the sleeve forming annular grooves near each extremity, packing-rings of larger external diameter than the sleeve  
40 arranged in the annular grooves, a cylindrical bearing-case whose bore is slightly larger than said sleeve and inclosing said parts, said case forming with said sleeve, packing-rings and radially-adjustable splines, thin closed  
45 chambers, there being annular spaces around the interior extremities of said case forming reservoirs, means for admission of fluid to the bearing, and means for the transmission  
50 of fluid from the reservoirs to the chambers.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN FRANCIS COOLEY.

Witnesses:

WILLIAM C. GRAY,  
LOUIS G. BARTLETT.